

LESHC 1.0.a (DRAFT 2.0)

List of Laboratory Control Levels Used in the Design of New or Modified Facilities



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LESHC

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1. Purpose and Scope

This document summarizes the control levels used by the Laboratory Environmental, Safety and Health Committee in the review of designs, SARs, ASEs or SADs related to new or modified facilities, or to cryogenic systems.

2. List of Control Levels

Control Level	Applicability	Source of Limit	Reason for Control Level
Less than 25 mrem in one year to individuals in other BNL Departments or Divisions adjacent to an accelerator or nuclear facility.	New or modified facilities that emit radiation or radioactive airborne materials.	BNL LESHCH records.	To ensure that non-trained personnel are kept below 100 mrem in one year from incidental exposure while working at BNL.
Less than 5 mrem per facility in one year to a person located at the site boundary	New or modified facilities that emit radiation or radioactive airborne materials.	BNL LESHCH records.	DOE established 25 mrem per year limit in the 1980s for the general public that required DOE permission to exceed. BNL apportioned 5 mrem per facility to ensure that there is something for everyone who might need it.
Groundwater concentration must not be greater than 5% of the Drinking Water Standard.	Facilities that cause radioactive liquids to enter or to be created directly in ground water.	SBMS Subject Area for Accelerator Safety.	EPA established rules that require offsite drinking water concentration to not result in 4 mrem or greater to an individual in one year. This BNL control level helps ensure the EPA rule can be met for multiple sources of groundwater contamination on site.

Airborne effluents from facilities shall not result in a dose that exceeds 0.1 mrem in one year to a person at the site boundary.	Facilities that emit airborne radioactive materials.	SBMS Subject Area Radioactive Emissions.	EPA established rules that require airborne emissions to be continuously monitored if they exceed 0.1 mrem to an individual in one year. This BNL control level helps ensure the EPA rule can be met.
Less than 1250 mrem in one year to a trained BNL employee, guest or user.	All facilities.	BNL RadCon Manual Paragraph 211.	To help ensure Laboratory staff achieves ALARA goals, BNL established Administrative Control Levels for individual dose.
Maximum radionuclide concentration less than 50% of the DWS and maximum tritium concentration less than 25% of the DWS at BNL sanitary sewer Outfall #1, caused by liquid discharges from a facility averaged over a 30-day interval.	All facilities that emit tritium liquid effluents to the sanitary sewer.	SBMS Subject Area Liquid Effluents.	BNL has chosen to limit the tritium in the sanitary system below the Drinking Water Standard out of concern for stakeholders. Justifications are required if a facility cannot meet this control level.
Neutron quality factors shall be doubled for designs at new facilities when neutron energy is known. If energy is unknown, then a quality factor of 20 shall be used.	All facilities.	BNL RadCon Manual Paragraph 125.	Design analyses based on these neutron quality factors are intended to be used to estimate the additional construction cost that would result if the neutron quality factor was increased. The results of these analyses shall be used to ascertain the economic feasibility for incorporating such modifications in the final design.

3. References

BNL SBMS
BNL RadCon Manual
LESHC Records

